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cont. specified layer is filled up in the second grooves, thus forming two portions having a high refractive index.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A method of fabricating a semiconductor laser having a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising the steps of:

Q2 forming said activation layer and a plurality of layers in parallel with said activation layer;

forming a first groove penetrating through at least some of said plurality of layers;

selectively etching a specified layer among at least some of said plurality of layers through which said first groove penetrates, said etching extending from both sides of the first groove to a predetermined position in said specified layer, thus forming a pair of second grooves; and

filling up said second grooves with a material having a refractive index higher than that of said specified layer, thus forming two portions having said high equivalent refractive index.

2. (Amended) A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than

that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer, wherein a first groove is formed penetrating through at least some of said plurality of layers;

a pair of second grooves, extending from said first groove to predetermined positions from both sides of said first groove, are formed in a specified layer among said plurality of layers through which said first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer, and thus two portions having said high equivalent refractive index are formed; and

another layer is formed so as to contact with the material having said high refractive index remaining on a surface portion of the first groove.

3. (Amended) A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer, wherein a first groove is formed penetrating through at least some of said plurality of layers;

a pair of second grooves, extending from said first groove to predetermined positions from both sides of said first groove, are formed in a specified layer among said plurality of layers through which said first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer, and thus two portions having said high equivalent refractive index are formed; and

another layer made of a different material from that having the high refractive index is formed so as to contact with a surface portion of the first groove.

Q2
Cont.
4. (Amended) A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer, wherein a first groove is formed penetrating through at least some of said plurality of layers to a specified layer;

a pair of second grooves, extending from the first groove to predetermined positions from both sides of the first groove, are formed in a specified layer among said plurality of layers through which the first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer; and

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layers made of a material having a refractive index are laminated on the material exposed in the first groove, this refractive index being lower than that of the material filled up in the second groove, and thus the two portions having said high equivalent refractive index are formed outside the material having the low refractive index.
